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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,929	06/07/2005	Yin Hao	A3-257 US	8588

7590 12/18/2006

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EXAMINER

GIRARDI, VANESSA MARY

ART UNIT PAPER NUMBER

2833

DATE MAILED: 12/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/537,929	HAO, YIN	
	Examiner	Art Unit	
	Vanessa Girardi	2833	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim objections

1. Claims 1-11 are objected to under 37 C.F.R. Rule 1.121(c) as stated in MPEP § 714. Markings to Show the Changes: All claims being currently amended must be presented with markings to indicate the changes that have been made relative to the immediate prior version. The changes in any amended claim must be shown by strike-through (for deleted matter) or underlining (for added matter) with 2 exceptions:

(1) for deletion of five or fewer consecutive characters, double brackets may be used (e.g., [[error]]);

(2) if strike-through cannot be easily perceived (e.g., deletion of number "4" or certain punctuation marks), double brackets must be used (e.g., [[4]]).

As an alternative to using double brackets, however, extra portions of text may be included before and after text being deleted, all in strike-through, followed by including and underlining the extra text with the desired change (e.g., ~~number 4~~ as number 14 as).

An accompanying clean version is not required and should not be presented. Only claims of the status "currently amended" or "withdrawn" will include markings.

Any claims added by amendment must be indicated as "new" and the text of the claim must not be underlined.

Claim Rejections - 35 USC § 103

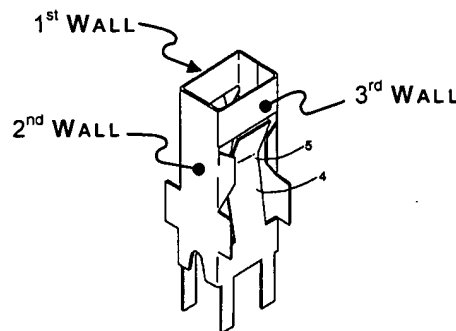
The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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2. Claims 1, 2, 5 and 6 are rejected under 35 U.S.C. §103(a) as being unpatentable over Higuchi et al. (US 5,975,963) in view of Wilson et al. (US 6,644,985 B2).

Higuchi et al. shows conductive terminal **1** capable of being received within a terminal channel **12** defined in an insulative housing **11**, having a contact portion **5** and a mounting portion **7** comprising: a first wall, a second wall connecting with the first wall in a certain angle and a third wall, connecting with the second wall in a certain angle and opposite to the first wall, and the mounting portion **7** extending out of the insulative housing **11** (Fig. 2).



However Higuchi et al. does not show the conductive terminal mounting portion defining a pyramidal space for receiving a solder ball.

Wilson et al. shows a conductive terminal **33** having a mounting portion **47** comprising a bottom surface **51** which may be planar or conical (pyramidal) (Col. 9, lines 27-31) for receiving a solder ball **9**.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the mounting portion of the conductive terminal of Higuchi et al. as taught by Wilson et al. using a pyramidal shape to secure the solder ball thus creating a conductive terminal that would have greater stability within the terminal channel coupled with improving adhesion of the solder ball (Col. 9, lines 37-41) to the mounting portion of the terminal. Both of these improvements would serve to enhance reliability during application and help minimize waste during production.

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With respect to claim 2; Higuchi et al. as modified by Wilson et al. has been discussed above as applied to claim 1.

However Higuchi et al. does not show the mounting portion defines a pyramidal space.

Wilson et al. shows the mounting portion **47** defines the pyramidal space **52** by using a side wall **44** connecting with an end of the first wall **43** which circles around a fictitious central line as an axis (Fig. 6C) Axis A.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to further modify the conductive terminal of Higuchi et al. whereby the mounting portion as taught by Wilson et al. would define a pyramidal space fashioned from a sidewall encircling a fictitious axis. Such a modification would increase the surface area available for the adhesion of the solder ball to the mounting portion (Col. 9, lines 37-41) creating greater stability within the contact assembly during its use and manufacturing.

With respect to claim 5; Higuchi et al. as modified by Wilson et al. has been discussed above. Higuchi et al. further shows the contact portion **5** comprises a first spring arm **4** formed on the first wall **3** and a second spring arm **4** corresponding to the first spring arm **4** and formed on the second wall **3**, the first spring arm **4** and the second spring arm **4** are adjacent to form a spring receiving structure (Fig. 2).

With respect to claim 6; Higuchi et al. as modified by Wilson et al. has been discussed above as applied to claim 1.

However Higuchi et al. does not show the pyramidal space.

Wilson et al. shows the mounting portion **47** defines the pyramidal space **52** in which the pyramidal space **52** is open at a top portion (Fig. 6E).

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Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to further modify the conductive terminal of Higuchi et al. whereby the pyramidal space as taught by Wilson et al. is open at the top which would improve solder management and solder adhesion (Col. 4, lines 51, 52) creating a more reliable contact.

3. Claims 1, 3, and 8 are rejected under 35 U.S.C. §103(a) as being unpatentable over Higuchi et al. (US 5,975,963) in view of Korsunsky (US 6,623,284 B1).

Higuchi et al. shows conductive terminal **1** capable of being received within a terminal channel **12** defined in an insulative housing **11**, having a contact portion **5** and a mounting portion **7** comprising: a first wall, a second wall connecting with the first wall in a certain angle and a third wall, connecting with the second wall in a certain angle and opposite to the first wall, and the mounting portion **7** extending out of the insulative housing **11** (Fig. 2).

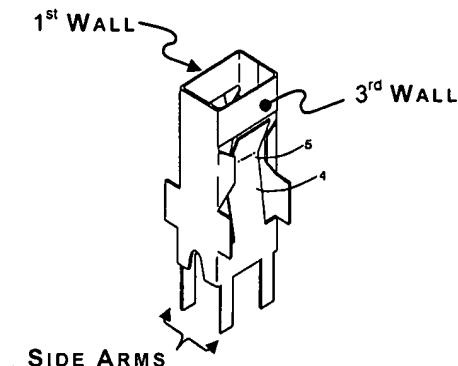
However Higuchi et al. does not show the conductive terminal having a solder ball received in a pyramidal space.

Korsunsky shows a conductive terminal **100** having a pyramidal space **36** receiving a solder ball **4**.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the conductive terminal of Higuchi et al. to have a solder ball received in a pyramidal space as taught by Korsunsky (Col. 3, lines 29, 35) which contributes to proper positioning of the solder ball thus serving to enhance reliability during use of the product and help minimize waste during production.

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With respect to claim 3; Higuchi et al. as modified by Korsunsky has been discussed above as applied to claim 1. Higuchi et al. further shows the conductive terminal **100** in which the mounting portion **7** comprises a first side arm connecting with an end of the first wall and a second side arm connecting with an end of the third wall, the first side arm and the second side arm separately extend out of the insulative housing (Fig. 1) **36**.

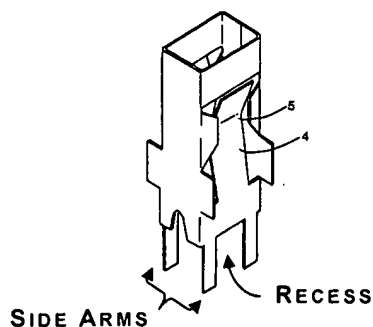


However Higuchi et al. does not show the conductive terminal side arms define a pyramidal space

Korsunsky shows a conductive terminal **3** having side arms **34** that define a pyramidal space **36**.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the conductive terminal of Higuchi et al. whereby the side arms are not flush with the housing but left at an obtuse angle to one another as taught by Korsunsky (Col. 3, lines 30-35) which aid in positioning of the solder ball prior to adhesion which would serve to minimize waste during production.

With respect to claim 8; Higuchi et al. shows at least one of the side arms includes a recess.



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4. Claims 4 and 7 are rejected under 35 U.S.C. §103(a) as being unpatentable over Higuchi et al. (US 5,975,963) and Korsunsky (US 6,623,284 B1) as applied to claims 3 and 1 above, and further in view of Ju (US 6,530,788 B1). Higuchi et al. as modified by Korsunsky has been discussed above.

However neither Higuchi et al. nor Korsunsky show or teach the mounting portion of the terminal comprising a horizontal portion.

Ju shows a conductive terminal **100** in which the mounting portion (*RELATIVE TO THE SOLDER BALL 11*) of the conductive terminal comprises a horizontal portion **102** connecting with the second wall (*AT 101*) the horizontal portion **102** is between the first side arm and the second side arm (Fig. 10).

With respect to claim 7; Ju shows the horizontal portion **102** is located between the first **104** and third walls **105**.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to apply the teachings of the horizontal portion located between the first and second side arm as taught by Ju (Col. 4, lines 14-23) to further modify the conductive terminal of Higuchi et al. / Korsunsky to further ensure the stability of the contact assembly, particularly where the solder ball is concerned thus minimizing defective manufacturing processes.

5. Claims 9 and 11 are rejected under 35 U.S.C. §103(a) as being unpatentable over Korsunsky (US 6,623,284 B1) in view of Higuchi et al. (US 5,975,963). Korsunsky shows an electrical connector having an insulative housing forming a mounting surface and a receiving surface, the insulative housing defining a plurality of terminal channels extending through the mounting surface and the receiving surface a plurality of conductive terminals respectively received in the corresponding terminal channels (Col. 2, lines 8-26) comprising:

a conductive terminal **3** having a mounting portion **340** electrically connecting with the circuit board **8** via the solder ball **4**, the mounting portion **340** defining a pyramidal space **36** extending out of the mounting surface **202** of the insulative housing **2** for receiving the solder ball **4**.

However Korsunsky does not show the conductive terminal having three walls.

Higuchi et al. does show a conductive terminal **1** having a first wall, a second wall connecting with the first wall in a certain angle and a third wall connecting with the second wall in a certain angle and opposite to the first wall (*ILLUSTRATED ABOVE WITH RESPECT TO CL. 1*), the conductive terminal forming a contact portion **5** electrically connecting with the electronic component **10** and a mounting portion **7** electrically connecting with the circuit board **11**.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the conductive terminal of Higuchi et al. to have the relationship between an electronic component and a circuit board as taught by Korsunsky using a solder ball thus creating a conductive terminal that would have greater stability within the terminal channel coupled with improving adhesion of the solder ball to the mounting portion of the terminal. Both of these improvements would contribute to greater stability within the contact assembly during its use and manufacturing.

With respect to claim 11; Korsunsky as modified by Higuchi et al. has been discussed above as applied to claim 9. Korsunsky shows the mounting portion **340** of the conductive terminal **3** comprises a first and second side arms **34** adjacent to one end of the mounting surface **202**, where the first and second side arms are aslant (Fig. 1) and extend out of the mounting surface **202** and are apart from each other to define a cone-shaped pyramidal space **36**.

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6. Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over Korsunsky (US 6,623,284 B1) and Higuchi et al. (US 5,975,963) as applied to claim 9 above, and further in view of Wilson et al. (US 6,644,985 B2). Korsunsky as modified by Higuchi et al. has been discussed above.

However neither Korsunsky nor Higuchi et al. show or teach the pyramidal space encircling an imaginary axis.

Wilson et al. shows a conductive terminal 33 where the mounting portion 47 defines the pyramidal space 52 by using a side wall 44 connecting with an end of the first wall 43 which circles around a fictitious central line as an axis (Fig. 6C) Axis A.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to further modify the conductive terminal of Korsunsky / Higuchi et al. whereby the mounting portion as taught by Wilson et al. would define a pyramidal space fashioned from a sidewall encircling a fictitious axis. Such modification would increase the surface area available for the adhesion of the solder ball to the mounting portion (Col. 9, lines 37-41) creating greater stability within the contact assembly during its use and manufacturing.

Response to Remarks

Drawings

7. Previously held objections to the drawings have been overcome by the manner in which claims 1 and 9 have been currently amended.

Claim objections

8. Previously held claim objections to minor grammatical error and spelling error have been overcome by the manner in which claim 9 has been currently amended.

Response to Arguments

9. Applicant's arguments filed October 10, 2006 regarding what is and is not a pyramidal surface have been fully considered but they are not persuasive. The commonly accepted definition of pyramidal is that which is typically a square ground plan, having outside walls in the form of four triangles that meet in a point at the top, and inner sepulchral chambers; a structure or object of similar form. Applicant has taken liberties in using the term pyramidal to describe the instant invention as evidenced in Figure 4 of the drawings filed on 6/7/05. Examiner has taken those same liberties in applying pyramidal to what is depicted in Korsunsky (US 6,623,284 B1).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vanessa Girardi: Telephone number (571) 272-5924.

Monday – Thursday 7 a.m. to 5:30 p.m. (EST)

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula Bradley can be reached on (571) 272-2800 ext 33.

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The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VG

Art Unit 2833
December 6, 2006



THO D. TA
PRIMARY EXAMINER